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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
GROSS, KENNETH A	

ART UNIT	PAPER NUMBER
2122	15

DATE MAILED: 07/03/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/552,292	ROBISON, ARCH D.	
	Examiner	Art Unit	
	Kenneth A Gross	2122	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 April 2003* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-6 and 10-18* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6 and 10-18* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4 .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

1. This action is in response to the amendment filed on April 21st, 2003.

Claim Objections

2. The numbering of claims is not in accordance with 37 CFR 1.126 which requires the original numbering of the claims to be preserved throughout the prosecution. When claims are canceled, the remaining claims must not be renumbered. When new claims are presented, they must be numbered consecutively beginning with the number next following the highest numbered claims previously presented (whether entered or not).

Misnumbered claims 7-15 been renumbered 10-18.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 18 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 18 teaches a method step that occurs outside of the scope of its parent claim. It is further unclear from Claim 18 when exactly the exceptional paths are removed from the tree.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1, 2, 10, 13, and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over "How Debuggers Work", Jonathan B. Rosenberg, 1996 (hereinafter Rosenberg) in view of McKinsey et al. (U.S. Patent Number 6,446,258).

For specific rejections of Claims 1 and 2 see the office action mailed on February 4th, 2003. (Note: Claim 1 has been amended to overcome certain 112 2nd paragraph issues, and has not changed the scope of the claims).

In regard to Claim 10, Rosenberg teaches the well-known concept of the 'program stack', which keeps track of addresses and local variables. Rosenberg teaches: (A) as the program is executing, the state of the stack is analyzed by 'unwinding' the stack at breakpoints to find the current state of the stack (page 136, lines 26-32); (B) partitioning the stack at each point into records or 'frames' that can be set separately (page 136, lines 25-26); (C) Rosenberg teaches storing addresses and variables on the stack, which is done with a push or similar command for storing information onto a stack (page 137, lines 28-32). These 'push' commands sets a component, or frame, of the stack by pushing information (such as addresses and variables) onto the stack, updating the state of the stack. Rosenberg does not teach computing placement of said operations to eliminate partial redundancy and inserting the set of operations and computed placements. McKinsey, however, does teach computing placement of code through a series of code motions (Column 1, lines 66-67 and Column 2, lines 1-2) in order to eliminate partial redundancy (Abstract), and also placing the instructions in the code through code motion in the order of the computed placement (Column 1, lines 62-65).). Therefore, it would

have been obvious to one of ordinary skill in the art at the time of the invention to analyze the state of a data structure at different program points, where the structure state is broken up into components and set, as taught by Rosenberg, and then computing placement of the set instructions in the code so as to eliminate partial redundancy and placing the set instructions in the code according to the computed placement, as taught by McKinsey, since this would allow for a more optimized program overall. Claim 13 corresponds directly with Claim 10 and is rejected for the same reasons as Claim 10.

In regard to Claim 14, Claim 14 corresponds directly with Claim 2 and is rejected for the same reasons as Claim 2.

6. Claims 3 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over "How Debuggers Work", Jonathan B. Rosenberg, 1996 (hereinafter Rosenberg) in view of McKinsey et al. (U.S. Patent Number 6,446,258) and further in view of Gordon et al. (U.S. Patent Number 6,507,805).

For specific rejections of Claim 3 see the office action filed on February 4th, 2003.

In regard to Claim 15, Claim 15 corresponds directly with Claim 3 and is rejected for the same reasons as Claim 3.

7. Claims 4, 5, 11, 12, 16, and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over "How Debuggers Work", Jonathan B. Rosenberg, 1996 (hereinafter Rosenberg) in view of McKinsey et al. (U.S. Patent Number 6,446,258) and further in view of Dunn et al. (U.S. Patent Number 6,247,172).

For specific rejections of Claims 4 and 5 see the office action mailed on February 4th, 2003. (Note: Claims 4 and 5 have been amended to overcome certain 112 2nd paragraph issues, and has not changed the scope of the claims).

In regard to Claim 11, Dunn teaches a stack structure that is used for exception handling, which stores the state of a program at a certain point (Column 1, lines 66-67 and Column 2, lines 1-8).

In regard to Claim 12, Dunn teaches an exception handling data structure referred to as a 'context structure' that stores the program state at a certain point, and is an element on the exception-handling stack. It is obvious that a pointer to the exception-handling stack would be a component, since a pointer would be necessary to access the stack in the case of an exception being thrown.

In regard to Claim 16, Claim 16 corresponds directly with Claim 4 and is rejected for the same reasons as Claim 4.

In regard to Claim 17, Claim 17 corresponds directly with Claim 5 and is rejected for the same reasons as Claim 5.

8. Claims 6 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over "How Debuggers Work", Jonathan B. Rosenberg, 1996 (hereinafter Rosenberg) in view of McKinsey et al. (U.S. Patent Number 6,446,258) and further in view of Dunn et al. (U.S. Patent Number 6,247,172) and Gordon et al. (U.S. Patent Number 6,507,805).

For specific rejections of Claim 6 see the office action filed on February 4th, 2003. (Note: Claim 6 has been amended to overcome certain 112 2nd paragraph issues, and has not changed the scope of the claims).

In regard to Claim 18, Claim 18 corresponds directly with Claim 6 and is rejected for the same reasons as Claim 6.

Response to Arguments

In regard to the argument that the office action equates tracing a stack for debugging with the applicant's claimed invention, the applicant is directed to the background section of the specification, which clearly discusses tracing the execution of a program by means of an application stack. Although the Rosenberg reference does not explicitly teach an exception handling stack, but rather a program stack, the concept is the same. The state of a program is stored on a stack for use in program tracing. The Dunn reference teaches an application stack that is used in the context of exception handling.

Claims 1-6 and 10-18 were interpreted in the broadest reasonable interpretations. The data structure in Claim 1 is interpreted to mean an object on the stack that contains the state of the program at certain program points. Partitioning is interpreted to mean retrieving the entire stack, and diving the stack into data structures, where each data structure contains the state of a program. Each component of the state is set at a program point, by pushing the data structure onto the stack, thus setting the component with the state of a program at a certain program point. The idea of arranging operations in a program to eliminate partial redundancy is well known in the art.

Conclusion

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kenneth A Gross whose telephone number is (703) 305-0542. The examiner can normally be reached on Mon-Fri 7:30-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tuan Q Dam can be reached on (703) 305-4552. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 746-7239 for regular communications and (703) 746-7240 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3900.

KAG
June 30, 2003

TUAN Q. DAM
PRIMARY EXAMINER